

Land Mollusca of the Three Kings Islands

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In 1935 I published a short paper on the land mollusca of Great Island, based upon a collection made during the "Will Watch" Expedition of February, 1934.

The present paper is descriptive of material from several subsequent sources—my own collecting during the "Arbutus" Expedition, November-December, 1945; Mr. E. G. Turbott's collecting, "Internal Affairs" Expedition, April-May, 1946; and the results of two expeditions in the keel yacht "Rosemary," January, 1947, and January, 1948, respectively, organised by Major M. E. Johnson and Major G. A. Buddle.

The last-mentioned gentlemen succeeded in making small collections on both North East Island, previously considered inaccessible, and South West Island, which had not been investigated since the late Mr. T. F. Cheeseman's brief visit in 1889. Further investigation is required before the land molluscan fauna of the entire group is made known, especially on the difficult West Island, upon which a landing has not yet been made. Great Island has been fairly thoroughly searched, and a bag of leaf-mould obtained by Major Buddle shows that North East Island has a rich micro-fauna, but on South West Island only one snail, a giant new species of *Rhytida*, was found.

A point of interest is that few of the small snails are common to both North East Island and Great Island, yet the comparatively large *Allodiscus cassandra* and the giant *Placostylus bollonsi* are found on both these islands. A probable explanation for the presence of the latter on North East Island is offered in the systematic section which follows.

Only one of the species in the following list is common to the mainland.* (See appendix at end of this paper.)

Murdochia solitaria Powell, 1935, Great Island.

Murdochia filicosta n. sp., North East Island.

Murdochia annectens n. sp., Great Island.

Allodiscus cassandra (Hutton, 1883), Great Island; North East Island.

Allodiscus turbotti n. sp., Great Island; North East Island.

Therasiella pectinifera (Powell, 1935), Great Island; North East Island.

Egestula gaza (Suter, 1909), Great Island.

Mocella manawatawhia Powell, 1935, Great Island; North East Island.

Laoma labyrinthica n. sp., Great Island.

Phrixgnathus subariel n. sp., North East Island.

Laomarex sericea n. sp., North East Island.

Paralaoma regia n. sp., North East Island.

Paralaoma turbotti n. sp., Great Island.

Rhytida (*Rhytidarex*) *johnsoni* n. sp., North East Island.

Rhytida (*Rhytidarex*) *buddlei* n. sp., South West Island.

Placostylus (*Basileostylus*) *bollonsi* (Suter, 1908), Great Island; North East Island.

Placostylus (*B.*) *bollonsi caperatus* n. subsp., Great Island.

Placostylus (*B.*) *bollonsi arbutus* n. subsp., Great Island.

**Tornatellinops novoseelandica* (Pfeiffer, 1853), North East Island.

CYCLOPHORIDAE

Genus **MURDOCHIA** Ancey, 1901.**Murdochia solitaria** Powell, 1935.

1935—*Murdochia solitaria* Powell, Proc. Malac Soc. 21 (4), p. 244, Pl. 26, figs. 1 and 2.

Localities: Great Island, one dead shell in leaf mould, 150 yards up valley to the S.W. of the provision depôt (A.W.B.P., "Will Watch" Expedition, Feb., 1934) (Holotype); Great Island, $\frac{1}{2}$ mile N.E. from S.E. landing on underside of decaying wood in leaf mould, kanuka (*Leptospermum*) scrub; 1 live adult, larger than the holotype (A.W.B.P., "Arbutus" Expedition, Nov.-Dec., 1945).

Height, 2.2 mm.; diameter, 2.3 mm. (Holotype).

Height, 3.1 mm.; diameter, 3.1 mm. (1945 example).

Holotype: In Auckland Museum.

The 1945 example is pale reddish-brown with a buff spiral band at the periphery. This species has a much wider umbilicus than in either of the two following species.

Murdochia filicosta n. sp. Pl. 53, fig. 4.

Shell small, acutely conical with lightly convex whorls and subangulate periphery, narrowly umbilicate and sculptured with dense oblique membranous axial threads. Whorls 6, including a small papillate protoconch of two smooth whorls. Spire about twice height of aperture. Post-nuclear sculpture of dense retractively oblique threads, about 55 on the body-whorl. Umbilicus a narrow chink partially obscured by the reflexed columellar lip. Aperture subcircular, connected across parietal wall by a thin callus. Colour very dark brown, almost black. Worn and partially bleached examples exhibit spiral colour bands in dark brown on a paler ground—a broad band occupying the lower half of the spire whorls, a narrower one on the base, emergent from the suture, and another encircling the umbilical area.

Height, 4.2 mm.; diameter, 2.9 mm. (Holotype).

Locality: North East Island in leaf mould, common (G. A. Buddle, Jan., 1948).

Holotype: In Auckland Museum.

Murdochia annectens n. sp. Pl. 53, fig 3.

Very similar to *filicosta* but broadly conical, with a lower spire, more definitely angled at the periphery and with more distant axial threads. Whorls $5\frac{1}{2}$, including a small papillate protoconch of two smooth whorls. Spire about $1\frac{1}{4}$ times height of aperture. Post-nuclear sculpture of numerous retractively oblique membranous axial threads, about fifty on the body-whorl. The axials are more widely spaced than in *filicosta* owing to the greater width of the shell. Umbilicus a narrow, oblique chink. Colour pale yellowish-brown with two broad chestnut bands upon the base.

Height, 4.3 mm ; diameter, 3.4 mm. (Holotype).

Locality: Great Island, $\frac{1}{2}$ mile N.E. from S.E. landing, on under side of decaying wood in leaf mould, kanuka (*Leptospermum*) scrub; 1 live example.

Holotype: In Auckland Museum.

The species is more closely allied to the North East Island *filicosta* than to *solitaria*, with which it was found.

FLAMMULINIDAE

Genus **ALLODISCUS** Pilsbry, 1892.

Type (s.d. Pilsbry, 1894): *Helix dimorpha* Pfeiffer.

Allodiscus cassandra (Hutton, 1883).

1883—*Charopa? cassandra* Hutton, N.Z. Jour. Sci. 1, p. 476.

1913—*Allodiscus cassandra*: Suter Man. N.Z. Moll., p. 637.

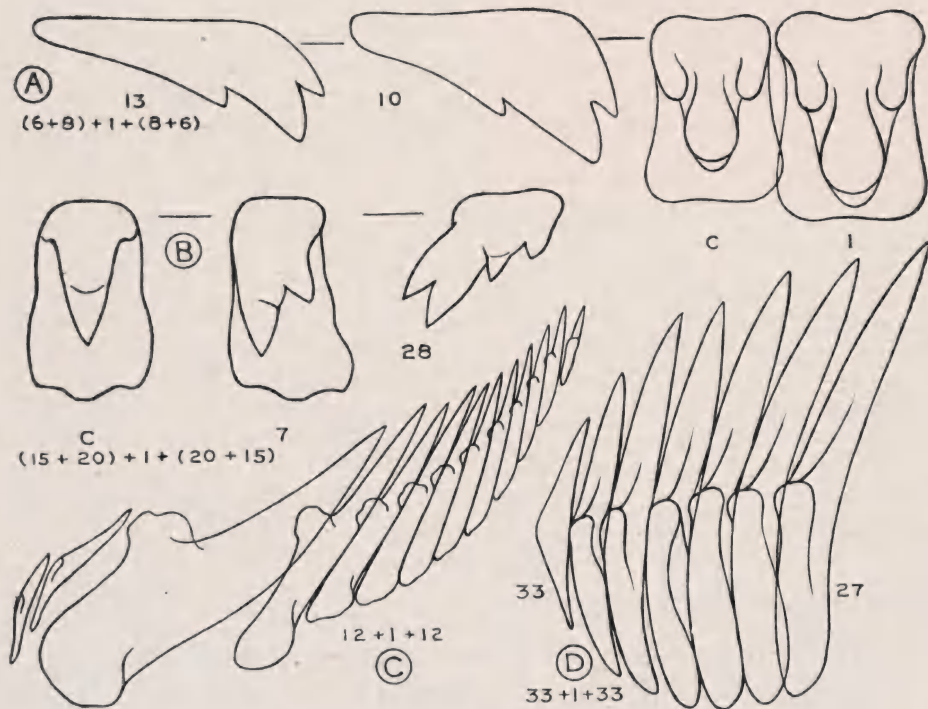
1935—*Allodiscus cassandra*: Powell Proc. Malac. Soc. 21 (4), p. 245.

Localities: Great Island, valley to S.W. of provision depot in leaf mould from around roots of *Carex* (A.W.B.P., "Will Watch" Expedition, Feb., 1934); Great Island, N.E. end of island (A.W.B.P., Nov.-Dec., 1945), S.W. side of island (E. G. Turbott, April, 1946); North East Island (G. A. Buddle, Jan., 1948).

Holotype: Canterbury Museum, Christchurch.

Dentition: (15 + 20) + 1 + (20 + 15) (Description, Powell, 1935, p. 245). Text fig. B.

This species and *Egestula gaza* are the only generally distributed common land molluscs on Great Island. They have adapted themselves to the induced monotony of kanuka scrub. They are found on and within rotting wood wherever mould provides sufficient food, for mostly there are no large leaved trees in the areas where these snails flourish.



Text fig. A. *Egestula gaza*, central tooth, first lateral and Nos. 10 and 13 from centre. B. *Allodiscus cassandra*, central tooth and Nos. 7 and 28 from centre. C. *Rhytida greenwoodi*, central to outermost lateral. D. *Rhytida (Rhytidarex) johnsoni*, laterals 27-33 from centre.

Allodiscus turbotti n. sp. Pl. 53, fig 1.

Shell globose, multicostate, umbilicate, pale-brown with a complicated pattern of radial bars, spots and chevrons. Whorls tightly coiled, $5\frac{1}{2}$, including a low, convex protoconch of $1\frac{1}{2}$ whorls, all but the nucleus sculptured with closely-spaced thin radials. Spire about two-thirds height of aperture. Post-nuclear sculpture of dense narrow radials, 42 on the first whorl, 85 on the penultimate and about 150 on the body-whorl. Interstices with from 4 to 10 exceedingly fine crisp radial threads. Radials flexuous, slightly protractive from suture and noticeably retractive before entering the umbilicus. Umbilicus open, one-tenth major diameter, deep, cylindrical, and slightly bridged by the reflexed inner lip. The base flattens somewhat towards the umbilicus and then resolves into a narrowly rounded encircling rim. Aperture lunate; peristome thin and flexuous, slightly protractive above, broadly rounded medially and deeply insinuated at the junction between the basal and inner sections of the lip. Suture deeply impressed, almost channelled. Colour pale brown with a chestnut colour pattern composed of irregular radially disposed rectangular patches at the suture which resolve into spots, and streaks of chevron form over the rest of the shell, base included. Major diameter, 5.7 mm.; minimum diameter, 5.1 mm.; height, 4.15 mm.

Locality: Great Island, north-east of Hakupu Point in sparse pohutukawa and kanuka forest (E. G. Turbott, 8/5/1946) (Holotype); North East Island, in leaf mould (G. A. Buddle, Jan., 1948) (one dead shell).

The species resembles *cassandra* in having a radially costate protoconch, but is of much smaller adult size, is openly umbilicate, and has more numerous and stronger radial ribs. In *cassandra* there is no umbilicus at any growth stage. The animal is unknown, but location in *Allodiscus* is almost certain from the style of sculpture and form of the aperture.

Genus THERASIELLA n. gen.

Type: *Nanina* (?) *celinde* Gray.

Inclusion of the small, depressed, acutely angulate *Phrixgnathus*-like *celinde* and *tamora* in *Therasia* is incongruous. The genus *Therasia* should be restricted to the larger, subglobose species centred around the genotype *thaisa*. Features of *Therasiella*, quite foreign in *Therasia*, are the presence of membranously plaited epidermal processes, and the small number of teeth in the radula ($18 + 1 + 18$), the marginals of which are bicuspid. In *thaisa* the formula is 26 to 28 + 1 + 28 to 26, and the marginals of this species and the associated *decidua*, *traversi* and *valeria* have from three to five cutting points.

Therasiella pectinifera Powell, 1935.

1935—*Therasia pectinifera* Powell Proc. Malac. Soc. 21 (4), p. 245.

Localities: Great Island, 150 yards up valley to the S.W. of the provision depot, in leaf mould (A.W.B.P., "Will Watch" Expedition, Feb., 1934); Great Island, N.E. end of island (A.W.B.P., Nov.-Dec, 1945); North East Island (G. A. Buddle, Jan., 1948). Not common.

Holotype: In Auckland Museum.

CHAROPIDAE

Genus **EGESTULA** Iredale, 1915.Type (o.d.): *Helix egesta* Gray.**Egestula gaza** (Suter, 1909).1909—*Endodonta (Charopa) gaza* Suter Proc. Malac. Soc. 8, p. 260.1913—*Endodonta (Charopa) gaza*: Suter Man. N.Z. Moll., p. 711.1915—*Egestula gaza*: Iredale Trans. N.Z. Inst. 47, p. 482.1935—*Egestula gaza*: Powell Proc. Malac. Soc. 21 (4), p. 246.*Locality*: Great Island.*Holotype*: In Suter collection, N.Z. Geological Survey, Wellington.

This species is very abundant in all parts of Great Island where there is sufficient cover. Even in the rather dry areas of kanuka it is commonly found on the ground on the under side of decaying twigs and branches. It is evidently absent from North East Island.

There are two colour forms, one uniformly ochreous-brown and the other, which is less common, with the addition of broad reddish-brown radial streaks.

Dentition: $(6 + 8) + 1 + (8 + 6)$ (Text fig. A). Study of the radula confirms Iredale's action (1915 l.c.) in associating the species with *egesta*, type of his genus *Egestula*. Both species differ from other Endodont genera in having low marginals with a very wide base, obliquely produced on the distal side. The formula for *egesta* is $9 + 5 + 1 + 5 + 9$.

Genus **MOCELLA** Iredale, 1915.Type (o.d.): *Helix corniculum* Reeve.**Mocella manawatawhia** Powell, 1935.1935—*Mocella manawatawhia* Powell, Proc. Malac. Soc. 21 (4), p. 246.

Localities: Great Island, 150 yards up the valley to the S.W. of the provision depot in leaf mould (type) (A.W.B.P., "Will Watch" Expedition, Feb., 1934); Great Island (E. G. Turbott, 4/5/1946); North East Island in leaf mould (G. A. Buddle, Jan., 1948). Very scarce.

Holotype: In Auckland Museum.

LAOMIDAE

Genus **LAOMA** Gray, 1849.Type: *Bulimus?* (*Laoma*) *leimonias* Gray.**Laoma labyrinthica** n. sp. Pl. 54, fig. 3.

Shell very small, trochiform, carinated, narrowly perforated, regularly and closely radially ribbed, subtranslucent white, radially streaked with broad patches of reddish brown; aperture with massive lamellate processes. Whorls five, including a smooth protoconch of $1\frac{1}{2}$ whorls. Post-nuclear whorls sculptured with distinct, rounded, slightly retractively arcuate radials (about 80 on penultimate and over 100 on the body-whorl), equally well developed on both dorsal and ventral surfaces, but interrupted at the acutely angled periphery by a sharply raised rounded

supra-sutural carina. Spire broadly conical, convex sided, about one and a-third times height of aperture. Aperture rhomboidal with thin discontinuous peristome, strengthened within by massive lamellate processes—one on the columella, two on the parietal wall, two within the outer lip above the carina, the uppermost very weak, and two on the basal lip. The most massive members are the columellar one and the proximal of the pair within the basal lip. The two within the outer lip are the least developed. The main processes are so large that they almost bridge the aperture.

Diameter, 2.35 mm.; height, 1.5 mm. (holotype).

Locality: Great Island, $\frac{1}{2}$ mile N.E. from S.E. landing on under side of decaying wood in leaf mould, kanuka (*Leptospermum*) scrub (A.W.B.P., Dec., 1945). One adult only.

Holotype: In Auckland Museum.

The species is nearest allied to *marina* Hutton, 1883, from which it differs in its much smaller size, more distant and definite radial ribs, conspicuous colour pattern and massive development of the apertural processes.

Genus *Phrixgnathus* Hutton, 1883.

Type (o.d.): *Helix fatua* Hutton, 1882, not of Pfeiffer.

= *Phrixgnathus celia* Hutton, 1883.

Phrixgnathus subariel n. sp: Pl. 54, fig. 4.

Shell small, depressed-turbinata, subperforate, thin, angulate, corneous, with regular fairly straight reddish-brown radial streaks. Whorls $4\frac{1}{2}$, including a low smooth protoconch of $1\frac{1}{2}$ whorls. Periphery weakly angulate. Spire depressed dome-shaped, equal to height of aperture. Post-nuclear sculpture of dense, weak, somewhat irregular radial ribs on the dorsal surface and closely spaced distinct spiral striations on the base. Radial colour streaks extending over all whorls from suture to the umbilicus, evenly retractively arcuate on the spire whorls and slightly flexuous on the base. Reflexed columella lip almost obscuring a tiny umbilical cavity.

Diameter: 2.8 mm.; height, 1.9 mm. (holotype).

Locality: North East Island, in leaf mould (G. A. Buddle, Jan., 1948).

Holotype and paratypes in Auckland Museum.

The species is nearest to *ariel* Hutton, which has a slightly taller spire, less conspicuous basal striations, and the colour streaks arranged in a vigorous zigzag pattern.

Genus *LAOMAREX* n. gen.

Type: *Laomarex sericea* n. sp.

This genus is provided for a species which, although it resembles *Phrixgnathus* in form, lacks the translucent texture of that genus. It has the addition of dense membranous radials reminiscent of *Therasiella*

nov. (described in this paper) and a strongly sculptured protoconch of beaded spirals. At first appearance the genus appears to be *Therasiella*, particularly on account of the dark brown membranous radials, but the protoconch is low and sculptured, not exsert, and smooth or practically smooth. The presence of an underlying radiate colour pattern is another feature foreign to *Therasiella* but common to the *Laomidae*.

Since no living examples were taken, the exact relationship of the genus still requires to be confirmed.

Laomarex sericea n. sp. Pl 54, fig. 1.

Shell small, depressed, broadly conical with angulate periphery and deep narrow umbilicus. Spire $1\frac{1}{2}$ times height of aperture, outlines broadly convex. Whorls 6, including a low dome-shaped protoconch of $1\frac{1}{2}$ whorls, distinctly sculptured with twelve dense beaded spirals and followed by a half-whorl of closely spaced radials. Post-nuclear sculpture of extremely dense and fine membranous radials, over 200 on the penultimate, overlying a surface sculpture of fine dense spiral threads. Dorsal surface and base similarly sculptured. Umbilicus a deep narrow pit. Colour dull brown, showing an obscure pattern of rather wide-spaced reddish-brown radial stripes.

Diameter, 3.25 mm.; height, 2.00 mm. (holotype).

Locality: North East Island, in leaf mould (G. A. Buddle, Jan., 1948).

Holotype and four paratypes in Auckland Museum.

Genus **PARALAOMA** Iredale, 1913.

Type (o.d.): *Paralaoma raoulensis* Iredale.

Paralaoma regia n. sp. Pl. 53, fig. 2.

Shell minute, depressed-turbinata, widely umbilicated, finely radially costate, thin, shining, horn coloured. Spire less than half height of aperture. Body-whorl narrowly rounded but not angled; periphery above the middle. Whorls $4\frac{1}{4}$, regularly and slowly increasing, including practically smooth protoconch of $1\frac{1}{2}$ whorls. On the last half whorl of the protoconch there are exceedingly fine spiral striations. Suture deeply impressed. Post-nuclear sculpture of numerous crisp retractorily arcuate radial ribs, about 40 on the penultimate and approximately 50 on the last whorl. Interstices reticulated with microscopic radial threads crossed by numerous spiral lirae. The radial threads number from 2 to 4 per intercostal space. On the base the spiral lirae are stronger than the radial threads, which they cross and render minutely granulate. Umbilicus deep, one-fifth major diameter of the base.

Major diameter, 1.7 mm.; minimum diameter, 1.45 mm.; height, 0.85 m.m. (holotype).

Locality: North East Island, in leaf mould (G. A. Buddle, Jan., 1948). Very abundant.

Holotype and paratypes in Auckland Museum.

The species is very similar to the Kermadec genotype, *raoulensis*, but is constantly smaller, has more numerous radial ribs (*raoulensis* has about 34 on the penultimate and over 40 on the body-whorl) and the

interstitial spiral lirae of the base dominate the interstitial radials. In *raoulensis* the interstitial radials are stronger than the spirals.

The protoconch in the genotype has weak spiral striations on the last half-whorl, and this same style of nucleus is found in *regia* and *turbotti* n. sps., *Hyalina allochroida lateumbilicata* Suter, 1890 (referred to *Paralaoma* by Iredale, 1915, Trans. N.Z. Inst. 47, p. 482), as well as in *Microphysa* (?) *pumila* Hutton, 1883, the closely allied *Patula rari-costata* Suter, 1890, and *Hyalina allochroida* Suter, 1890 (all here referred to *Paralaoma*). Unfortunately the dentition of *raoulensis* is not known to me, but the New Zealand *lateumbilicata* and *pumila* are alike in having a small number of bicuspid lateral-marginal teeth and a tricuspid central tooth (14 + 1 + 14 for *lateumbilicata* and 13 + 1 + 13 for *pumila*). In *leimonias*, the genotype of *Laoma*, the formula is 25 + 1 + 25, consisting of a unicuspid central and bicuspid lateral-marginal teeth. In *celia*, the genotype of *Phrixgnathus*, the formula is 20 + 1 + 20, consisting likewise of a unicuspid central and bicuspid lateral-marginals. The *Phrixgnathus* species *ariel*, *conella*, *cheesemani*, *glabriuscula*, *marginata* and *phrynia* have teeth of similar style to those of the genotype *celia*, and the numerical formulae range between 26 + 1 + 26 and 40 + 1 + 40.

***Paralaoma turbotti* n. sp. Pl. 54, fig. 2.**

Shell minute, depressed-turbinate, narrowly umbilicated, closely radially costate, microscopically densely spirally striate, thin, shining, uniformly light brown. Spire slightly taller than height of aperture. Suture deeply impressed. Whorls $4\frac{1}{2}$, slowly increasing, including a low rounded protoconch of $1\frac{1}{2}$ microscopically spirally striated whorls. Post-nuclear sculpture of numerous somewhat irregular rounded radial ribs, stronger on dorsal surface; about 60 on the penultimate and approximately 90 on the body-whorl. The whole surface crowded with dense, microscopic, spiral, linear-spaced lirations, interstitial on the dorsal surface but crossing the weakened radials of the base. Umbilicus deep, narrow and straight sided, about one-eighth major diameter of the base. Aperture lunate, with thin outer lip. Inner lip reflexed, partly concealing the umbilicus.

Major diameter, 1.6 mm.; minimum diameter, 1.45 mm.; height, 1.0 mm. (holotype).

Locality: Great Island (E. G. Turbott, 4/5/1946) ; $\frac{1}{2}$ mile N.E. from S.E. landing, Great Island, on under side of decaying wood in leaf mould, kanuka (*Lep-tospermum*) scrub (A.W.B.P., Dec., 1945).

Holotype and two paratypes in Auckland Museum.

This species resembled both *allochroida* Suter and *lateumbilicata* Suter in its depressed turbinate form, style of sculpture and faintly spirally striated protoconch. It differs from both in having a greater number of radial ribs, an umbilicus wider than in *allochroida* and narrower than in *lateumbilicata*, and in being darker in colour.

Suter gave the dimensions of his *allochroida* as 1.5 mm. x 1 mm., which is incorrect, for his largest co-type is only 1.3 mm. One of Suter's three co-types measuring 1.25 mm. x 1.15 mm. x 0.85 mm. has been segregated as a lectotype.

The animals of both *allochroida* and the subspecies *sericata* (Suter, 1890) are unknown and the three dried examples of *turbotti* are unsuitable for anatomical study. These species are placed provisionally in *Paralaoma* rather than in *Phrixgnathus*, for on shell characters they appear to be more in accord with the former.

PARYPHANTIDAE

Genus **RHYTIDA** Albers, 1860.

Subgenus **RHYTIDAREX** n. subgen.

Type: *R. (Rhytidarex) johnsoni* n. sp.

Although the North East Island *Rhytida* described below has normal external characteristics, the dentition is quite discordant. In typical *Rhytida* the dental formula ranges between $12 + 0 + 12$ for *mecesoni* and $18 + 1 + 18$ for *dunniae* and *patula*. All have the aculeate laterals gradually increasing in size, until near the margin, where a disproportionately large and massive tooth occurs, followed by from one to five very small teeth. In the new subgenus *Rhytidarex* the formula is $33 + 1 + 33$, all the laterals are narrowly aculeate, and there is no disproportionately large member. The laterals increase gradually to number 30 and then rapidly decrease, number 33 being only half the size of 30. Actually the radula of *Rhytidarex* more closely resembles that of *Wainuia*, the formula of which ranges between $14 + 1 + 14$ for *urnula* and $26 + 1 + 26$ to $27 + 1 + 27$ for *edwardi*. The form of the radula in *Wainuia* is very similar to that of *Rhytidarex*, no extra large member, just gradually increasing aculeate laterals to the last but one, the last being half the height of the largest. The thin dark chitinous shell of *Wainuia*, however, is very different in structure from that of *Rhytida*, which is strongly reinforced with lime.

Protoconch similar to that of *greenwoodi*, the genotype of *Rhytida*, but with less distinct radial sculpture.

Rhytida (Rhytidarex) johnsoni n. sp. Pl. 55, figs. 10-12.

Shell of moderate size for the genus, thin and depressed, with rapidly increasing whorls. Whorls $3\frac{1}{2}$, including a slightly convex protoconch of $1\frac{1}{2}$ weakly radially wrinkled whorls. Post-nuclear whorls commencing with fairly regular, closely spaced radial wrinkle-striae, but becoming irregularly anastomosing and finally malleate over the latter half of the body-whorl. This sculptural pattern is fine but distinct on the dorsal surface, but obsolescent on the base from just below the periphery. The periphery is narrowly rounded, scarcely carinated. Umbilicus deep, graduate, about one-eighth major diameter of base. Spire about one-third height of shell. Colour of epidermis uniformly pale yellowish olive.

Major diam., 22.0 mm.; min. diam., 17.5 mm.; ht., 11.5 mm. (holotype)

Major diam., 22.0 mm.; min. diam., 17.0 mm.; ht., 11.2 mm. (paratype)

Major diam., 21.6 mm.; min. diam., 17.0 mm.; ht., 11.7 mm. (paratype)

Animal narrow, dorsal surface dark smoky grey, with a narrow, light-brown median stripe, clouded with dark grey towards the head. Neck and sides with rather large ovate flattened granules. Edge of foot and sole fawn to pale smoky grey. Tentacles dark grey, finely granulate.

Radula: 33 + 1 + 33, described above (text fig. D.).

Egg: 5.75 mm. \times 4.5 mm. This is larger than for any of the mainland species so far recorded (see O'Connor, 1945, Trans. Roy. Soc. N.Z. 75, p. 54).

Locality: North East Island under decaying leaves at the fringe of the large puka grove (*Meryta*) which caps the island, (M. E. Johnson and G. A. Buddle, Jan., 1948).

Holotype and paratypes in Auckland Museum.

The species is named in recognition of Major M. Earle Johnson's fine exploration work in the Three Kings Group, especially for his feat of landing upon the previously considered inaccessible North East Island.

Rhytida (*Rhytidarex*) buddlei n. sp. Pl. 55, figs. 8, 9.

Shell very large, larger than any other known species, thin and depressed with rapidly increasing whorls. Whorls $4\frac{1}{2}$, including a protoconch of $1\frac{1}{2}$ whorls (worn in only specimen). Periphery narrowly rounded, scarcely carinated. Umbilicus deep, gradate, one-sixth major diameter of the base. Surface badly worn but showing on the dorsal surface dense radial wrinkle-striae becoming malleated over the later whorls. The base from below the periphery is more or less smooth as in *johnsoni*. Spire about one-third height of shell. Traces of a thin brownish epidermis remain.

Major diameter, 64.0 mm.; minimum diameter, 51.0 mm.; height, 29.0 mm. (holotype).

Locality: South West Island, Three Kings Islands, G. A. Buddle and M. E. Johnson, 3rd Jan., 1947. One specimen only picked up from amongst leaves in a large puka grove (*Meryta*) near the crest of the island.

Holotype: In Auckland Museum.

Apart from its much greater adult size, this species closely resembles the North East Island *johnsoni*, the only obvious difference being in the manner of the coiling, which is more tightly wound in *buddlei*.

The species is named in recognition of Major G. A. Buddle's excellent work in making natural history collections and observations at the Three Kings group in company with Major M. Earle Johnson.

PLACOSTYLIDAE

Genus **PLACOSTYLUS** Beck, 1837.

Subgenus **BASILEOSTYLUS** Haas, 1935.

Type (o.d.) *Placostylus bollonsi* Suter, 1908.

Placostylus bollonsi was discovered on Great Island by the late Captain J. Bollons, of the Government Steamer "Hinemoa," in April, 1907.

Mr. H. B. Williams, formerly second officer on the Government Steamer "Matai," who was present when the species was discovered, stated that it occurred in a small karaka grove (*Corynocarpus laevigata*) near a large overhanging rock on the S.E. landing slope, below the provision depot.

In 1920 Captain Bollons informed the writer that only about fifty specimens, inclusive of old shells, had been found, and that in his opinion the species had become extinct.

In December, 1928, an empty shell was picked up in "tussock" on the S.E. landing slope by Lady Alice Fergusson, but no living examples were found (Fraser, 1929, N.Z. Journ. Sci. and Tech. 11 (3), p. 154).

During the "Will Watch" Expedition, February, 1934, a determined search was made during two half days on the island, but no trace of the species was found apart from a fragment picked up by Mr. C. A. Fleming on the N.W. landing slope (Powell, 1935, Proc. Malac. Soc. 21, p. 247).

The following account describes the finding of four living colonies and one recently exterminated, all additional to the original locality.

1. Great Island, S.E. landing slope. Type locality; in small karaka grove near a large overhanging rock on the S.E. landing slope, Great Island. The vegetation on this slope has been greatly altered by the depredations of goats (recently exterminated). There is no trace of the original karaka grove, only *Carex* and rather sparse kanuka (*Leptospermum ericoides*). No evidence of *Placostylus* remains was found, but it was here that Lady Alice Fergusson picked up an empty shell in 1928. The type colony is undoubtedly extinct.

2. Great Island, N.E. colony. Situated at about 500 feet elevation, above the level of the Provision Depot and about half a mile north-east from it, on the lower side of a long, rocky cliff-face in moderately dense scrub. The colony consisted apparently of only eleven snails (all adults) and was restricted to the leaf spread area afforded by a group of seven trees of wharangi (*Melicope ternata*) and one of mahoe (*Melicytus ramiflorus*). The area occupied by the colony was not more than 5 to 10 feet wide and 30 feet long, on a slope of about 45°.

Very large boulders through the area made it impossible to be certain that the entire colony was counted. Two complete but old eggs were found and some dead juveniles.

Colony located by the writer during eight days on the island—"Arbutus" Expedition, November-December, 1945.

3. North East Island colony. North East Island is separated by a narrow waterway from the N.E. end of Great Island. In contrast with the greatly altered vegetation and semi-arid condition of Great Island, North East Island is covered with luxuriant vegetation dominated by a large grove of puka (*Meryta sinclairii*). In January, 1947, Messrs. G. A. Buddle and M. E. Johnson landed on this almost inaccessible island and found *Placostylus* in abundance over most of the island. A series of living examples and ten complete but old eggs were taken.

4. Great Island, N.W. landing slope. In stunted ngaio scrub, at about 500 feet elevation on the N.W. slope above the landing and about 500 yards west of the saddle. Some 40 living examples were observed by Mr. E. G. Turbott in April, 1946, and about 200 dead shells were taken. The colony was discovered by Mr. L. C. Bell.

5. Great Island, S.W. colony. In a small hanging valley near the foot of a boulder scree at about 700 feet elevation on the seaward slope of the western side of the island, just south of Crater Head. The snails were found in a deep accumulation of leaves amongst boulders in a grove consisting of mahoe, *Melicytus ramiflorus* (2), wharangi, *Melicope ternata* (2), puriri, *Vitex lucens* (1), *Sideroxylon costatum* (1), and *Olea apetala* (1). Adjoining was a group of large *Brachyglottis* n. sp. (14) (see Oliver, p. 236) and pohutukawa *Metrosideros tomentosa* (1). The colony was concentrated in the first grove, but one example was found under the *Brachyglottis* and this was observed eating dead leaves of this tree. Twenty-five snails were counted, nearly all adults, but owing to the numerous inaccessible crevices between boulders there could be more than double this number present. The colony was discovered by Messrs. R. Wilson and G. A. Buddle, "Arbutus" Expedition, November-December, 1945.

6. Great Island, Hapuku Point colony. Several hundred yards east of Hapuku Point on steep boulder scree in sparse forest consisting mainly of large pohutukawa and kanuka. The undergrowth had been eaten out by goats and the ground trampled and rendered too dry for living snails. A number of weathered dead shells were collected by Mr. E. G. Turbott in April, 1946.

Following are detailed measurements of ten examples from each of the six known colonies of *bollonsi*.

The average figures given at the end show that there are two groups: (A) shells with a height of two and one-third times that of the aperture and (B) shells with a height of two and a-half times that of the aperture.

Group A colonies (localities 1, 2 and 3) have an average height of between 91.65 mm. and 95.67 mm., but Group B colonies subdivide into B1, a small-sized race (locality 4) with an average height of 90.20 mm., and B2, a large-sized race (localities 5 and 6) with average heights of 108.40 mm. and 97.85 mm. respectively.

These groups are located as follows: A. *Typical* (localities 1, 2 and 3), north-east end of Great Island and North East Island. B1. north-west landing slope, and B2 S.W. side of Great Island.

The presence of three different forms of *bollonsi* on one comparatively small island requires some explanation, especially as the form from the neighbouring North East Island is not a distinct one but is identical, or almost identical, with one of the Great Island forms.

There are several possible explanations for this. Firstly, the state of the vegetation just prior to the removal of the goats in 1946 was very adverse to the existence of these snails on Great Island. They were restricted to a very few small areas of their succulent food plants in a widespread expanse of kanuka (*Leptospermum*) scrub. Each colony was small and completely isolated from the others by the general cover of kanuka scrub, which apparently does not provide suitable food for these large herbivorous snails.

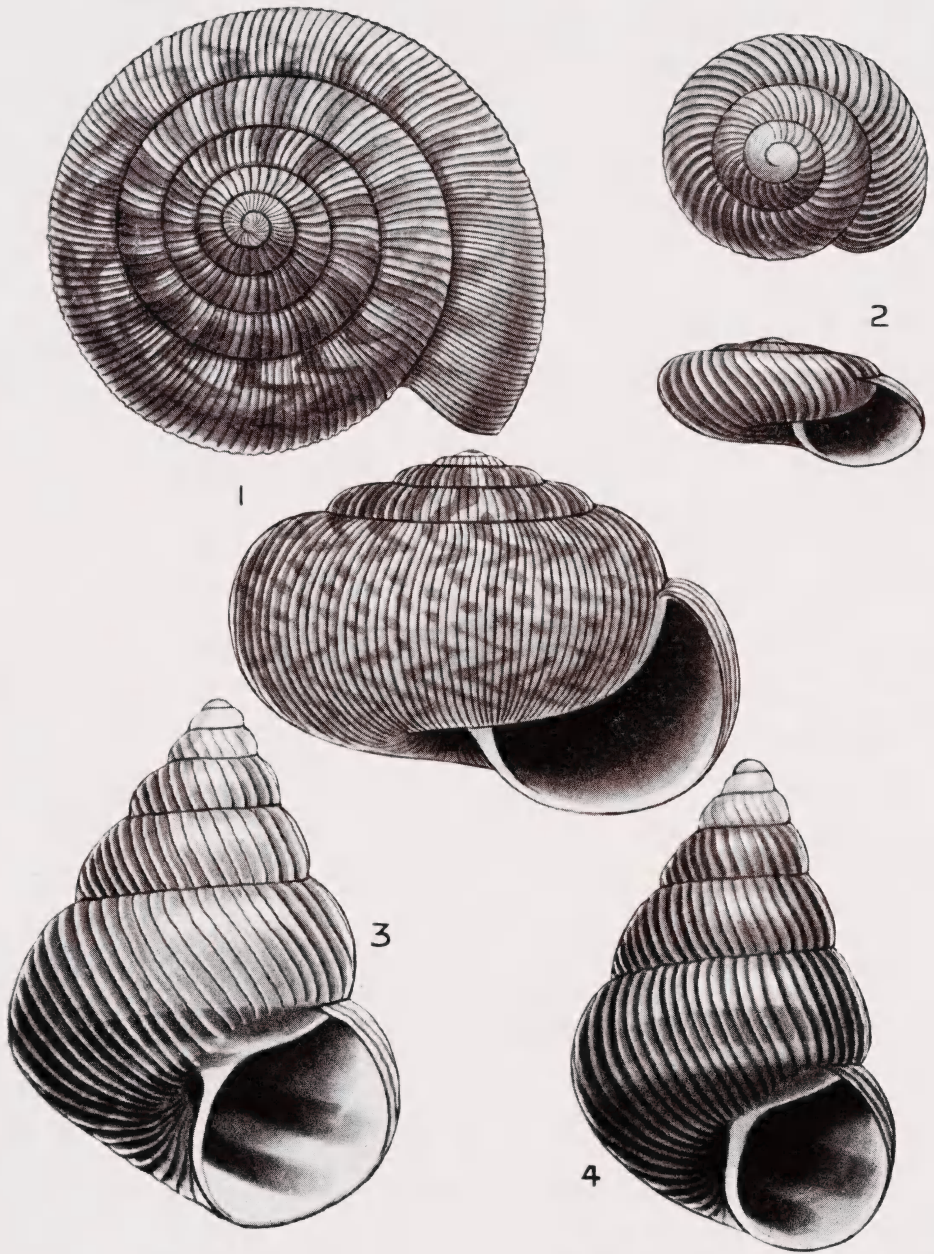


Fig. 1. *Allodiscus turbotti* n. sp., 4.15 mm. x 5.7 mm. Great Id. Holotype.

Fig. 2. *Paralaoma regia* n. sp., 0.85 mm. x 1.7 mm. North East Id. Holotype.

Fig. 3. *Murdochia annectens* n. sp., 4.3 mm. x 3.4 mm. Great Id. Holotype.

Fig. 4. *Murdochia filicosta* n. sp., 4.2 mm. x 2.9 mm. North East Id. Holotype.

It is at once apparent that the vegetation on Great Island has been greatly modified. In spite of its being well watered, Great Island is the one semi-arid member of the four larger islands comprising the group. There can be little doubt that Great Island once resembled these other islands, where the puka (*Meryta sinclairii*) is a dominant feature.

Coupled with the depredations made by the goats must be added the prior human factor of at least three centuries of occupation by Maoris.

At the time of Tasman's discovery of the islands in 1643, Maoris were in occupation; and Tasman noted in his journal that most of the more accessible parts were under cultivation. This was probably an important factor in reducing the snail populations to the perimeter of more or less inaccessible cliff faces. It is significant that the existing snail colonies are on steep, rocky slopes, which do not show signs of Maori occupation. The presence of rocky screes at each of the localities where *boltonsi* still persists shows that rough ground conditions have been the prime factor in the preservation of these colonies from extinction. These rocky screes have allowed an accumulation of leaves in their interstices, tended to conserve moisture, and above all have prevented trampling by goats. Several likely looking groves of large-leaved trees not on rocky ground proved negative for snails owing to the almost complete removal of undergrowth by the browsing goats.

Some factor earlier than the human one must have operated, however, as shown by the present occurrence of group A and B snails respectively, the former on the north-eastern portion of the hour-glass shaped Great Island, and the later on the south-western portion. The narrow neck or saddle in question may have been a former waterway dividing Great Island into two islands, but more likely the presence of nesting colonies of gulls and petrels on this neck has long maintained ground conditions impassable to the snails.

There remains the difficult explanation of why the North East Island snails are so nearly identical with those from the N.E. end of Great Island. The waterway separating North East Island is deep and evidently of considerable age, so human agency is the most likely explanation. Messrs. Buddle and Johnson found much evidence of former Maori occupation on North East Island, which was evidently used as a kitchen garden, for there are the remains of extensive stone contour walls, built to prevent the soil from washing down the steep slopes. Similar walls occur on Great Island.

The assumption is that these snails were either intentionally or unintentionally introduced to North East Island from the north-eastern end of Great Island. Young *Placostylus* could easily have been accidentally transported with plants taken by the Maoris for replanting on North East Island.

It is of note that Mr. A. C. O'Connor found living young *Placostylus hongii* in *Astelia* clumps situated 8 to 10 feet from the ground on puriri limbs at Whangaruru.

The existence of several well-marked subspecies of *Placostylus* on a small island is paralleled by an example at Lord Howe Island, where at least three recent forms and a fossil one are found within the confines of an island less than seven miles long and about a mile wide.* One of these, *Placostylus bivaricosus etheridgei* (Brazier) is larger, thinner and more elongated than the typical species. It lives high up under the wall of Mt. Lidgbird, just as its parallel on Great Island (No. 5 colony) shows similar shell divergence from the typical form and occupies a similar location.

Whatever the reason may be for the divergence in form of the *bollonsi* colonies as at present segregated, there seems to be justification for giving nomenclatural status to the three forms as subspecies brought about by isolating factors.

Objection may be raised to my action in giving names to subspecies that possibly owe their origin to either human or to ecological agency. On the other hand, the giving of nomenclatural status to these variant colonies will help to keep the problem in view, inasmuch as that the validity of the names will doubtless come up for consideration from time to time in the future, and may lead to further field investigation.

Now that the goats have been eliminated the Great Island vegetation will have a chance to recover and in the course of time may provide sufficient continuity of succulent, large-leaved vegetation to enable the spread and intermingling of the now segregated *Placostylus* colonies. In 25, 50 or more years' time a re-survey of the *bollonsi* colonies should yield useful information on the species problem.

TABLES OF DIMENSIONS.

A.—Adult shells from six BOLLONSI colonies.

1. Great Island, S.E. landing slope (type locality).

Ht.	Diam.	Ap. ht.	Sp. ratio.	Sp. ang.
97.00 mm.	39.00 mm.	42.00 mm.	2.31	38°
95.50 mm.	39.00 mm.	41.00 mm.	2.33	35°
94.50 mm.	37.00 mm.	40.00 mm.	2.36	34°
93.50 mm.	36.50 mm.	39.00 mm.	2.39	34° (P)†
92.50 mm.	39.00 mm.	40.50 mm.	2.28	34° (P)
91.00 mm.	37.50 mm.	39.50 mm.	2.31	35° (H)†
90.00 mm.	35.00 mm.	37.00 mm.	2.43	37°
88.00 mm.	37.50 mm.	39.00 mm.	2.25	39°
87.50 mm.	35.00 mm.	36.00 mm.	2.43	38° (P)
87.00 mm.	36.00 mm.	38.00 mm.	2.28	36° (P)

2. Great Island, N.E. Colony.

100.00 mm.	39.00 mm.	42.00 mm.	2.38	35°
100.00 mm.	39.00 mm.	41.00 mm.	2.44	36°
99.00 mm.	40.00 mm.	42.50 mm.	2.33	38°
96.00 mm.	38.00 mm.	40.00 mm.	2.40	35°
95.00 mm.	39.50 mm.	39.50 mm.	2.41	37°
93.00 mm.	39.00 mm.	39.00 mm.	2.38	36°
92.00 mm.	38.50 mm.	40.00 mm.	2.30	38°
91.50 mm.	38.00 mm.	40.00 mm.	2.28	36°
91.00 mm.	38.50 mm.	39.00 mm.	2.33	37°
90.00 mm.	37.50 mm.	40.00 mm.	2.25	40°

* Iredale, 1944 (Aust. Zool. 10 (3), p. 309), quotes Mr. Roy Bell as recognising six different colonies of *bivaricosus*, separable in the field, and stating that the colonies apparently breed true.

3. North East Island.

99.50 mm.	43.00 mm.	43.00 mm.	2.31	40°
97.00 mm.	39.50 mm.	41.00 mm.	2.37	46°
97.25 mm.	41.00 mm.	44.00 mm.	2.21	44°
97.00 mm.	40.50 mm.	42.00 mm.	2.31	42°
97.00 mm.	38.50 mm.	42.00 mm.	2.31	42°
96.00 mm.	40.00 mm.	42.00 mm.	2.28	44°
95.00 mm.	40.00 mm.	41.50 mm.	2.28	42°
93.00 mm.	38.00 mm.	41.00 mm.	2.26	40°
93.00 mm.	37.00 mm.	39.00 mm.	2.38	40°
91.50 mm.	38.00 mm.	41.50 mm.	2.21	44°

4. Great Island (N.W. landing slope).

97.00 mm.	36.00 mm.	37.50 mm.	2.58	33°
92.50 mm.	33.50 mm.	37.00 mm.	2.50	36°
91.00 mm.	36.50 mm.	36.50 mm.	2.49	38°
91.00 mm.	34.50 mm.	36.00 mm.	2.53	33° (H)
90.50 mm.	35.00 mm.	35.00 mm.	2.58	34°
90.00 mm.	34.00 mm.	35.00 mm.	2.57	36°
89.50 mm.	34.00 mm.	34.00 mm.	2.63	35°
88.00 mm.	33.00 mm.	35.00 mm.	2.51	33°
87.50 mm.	36.00 mm.	36.00 mm.	2.43	37°
84.00 mm.	33.50 mm.	35.00 mm.	2.40	38°

5. Great Island (S.W. colony).

113.50 mm.	42.00 mm.	44.00 mm.	2.58	34° (H)
112.50 mm.	42.00 mm.	44.00 mm.	2.55	30°
110.00 mm.	40.00 mm.	43.50 mm.	2.53	30°
109.00 mm.	41.00 mm.	43.00 mm.	2.53	32°
108.00 mm.	40.00 mm.	43.00 mm.	2.51	31°
108.00 mm.	42.00 mm.	46.00 mm.	2.35	33°
107.50 mm.	39.50 mm.	43.00 mm.	2.50	31°
106.50 mm.	40.00 mm.	46.00 mm.	2.32	35°
104.00 mm.	40.00 mm.	42.50 mm.	2.44	35°
104.00 mm.	40.00 mm.	43.00 mm.	2.42	33°

6. Great Island (Hapuku Point).

102.00 mm.	41.00 mm.	41.00 mm.	2.49	32°
101.00 mm.	34.00 mm.	36.00 mm.	2.81	26°
100.00 mm.	36.00 mm.	41.00 mm.	2.44	34°
100.00 mm.	38.00 mm.	42.00 mm.	2.38	37°
98.00 mm.	38.00 mm.	41.00 mm.	2.39	33°
97.00 mm.	38.00 mm.	40.00 mm.	2.42	33°
97.00 mm.	39.00 mm.	42.00 mm.	2.31	36°
96.50 mm.	35.50 mm.	38.00 mm.	2.54	30°
93.50 mm.	37.00 mm.	41.00 mm.	2.33	34°
93.50 mm.	35.00 mm.	36.00 mm.	2.59	31°

† H = holotype, P = paratype.

B.—Adult shells. Averages for each of six colonies.

Colony.	Ht.	Diam.	Sp. ratio.	Sp. ang.
1.	91.65 mm.	37.15 mm.	2.33	36°
2.	94.75 mm.	38.70 mm.	2.35	36.8°
3.	95.67 mm.	39.55 mm.	2.29	42.4°
4.	90.20 mm.	34.60 mm.	2.52	35.3*
5.	108.40 mm.	41.45 mm.	2.47	32.4°
6.	97.85 mm.	37.15 mm.	2.47	32.6°

C.—The egg.

Length.	Diameter.	Colony.
*17.50 mm.	13.00 mm.	No. 1
17.70 mm.	12.60 mm.	No. 2
16.70 mm.	12.70 mm.	No. 2
17.00 mm.	12.25 mm.	No. 3
16.80 mm.	12.40 mm.	No. 3
16.00 mm.	11.90 mm.	No. 3
15.75 mm.	11.25 mm.	No. 3
15.70 mm.	11.25 mm.	No. 3
15.50 mm.	10.90 mm.	No. 3
15.00 mm.	11.80 mm.	No. 3
15.00 mm.	11.60 mm.	No. 3
14.50 mm.	11.10 mm.	No. 3
12.70 mm.	10.00 mm.	No. 3
15.395 mm.	11.445 mm. = Average for 10 examples No. 3 colony.	

* Suter, 1913 (Man. N.Z. Moll., p. 764), cited 18 mm as the length of this egg, which is in the Suter collection. Suter described the egg from old infertile examples as "calcareous, thin, white, finely granular, with a few larger granules irregularly interspersed." To this I now add that a fresh example laid by a captive specimen on 7/12/1945 had a thin, smooth, olive cuticle.

D.—The embryonic shell.

Height.	Diameter.	Colony.
15.00 mm.	12.00 mm.	No. 2
16.50 mm.	11.00 mm.	No. 5
17.75 mm.	12.25 mm.	No. 3
17.75 mm.	13.00 mm.	No. 2

Placostylus (Basileostylus) bollonsi bollonsi Suter, 1908. Pl. 55, figs. 1-3.

1908—*Placostylus bollonsi* Suter Trans. N.Z. Inst. 40, p. 340, Pl. 25.

1913—*Placostylus bollonsi*: Suter Man. N.Z. Moll. p. 763, Pl. 30, figs. 11a, b (1915).

1935—*Placostylus bollonsi*: Powell Proc. Malac. Soc. 21 (4), p. 247.

1935—*Placostylus (Basileostylus) bollonsi*: Haas Zool. Anzeiger 15 (2), Br. 109, 7-8, p. 189.

1938—*Placostylus bollonsi*: Powell Rec. Auck. Inst. Mus. 2 (3) p. 150.

The typical species has a spire ratio of from 2.29 to 2.33; that is, the height of the shell is approximately two and one-third times the height of the aperture. The maximum dimensions recorded were 100.00 mm. in height by 39.00 mm. in diameter, and the minimum adult dimensions 87.00 mm. by 36.00 mm.

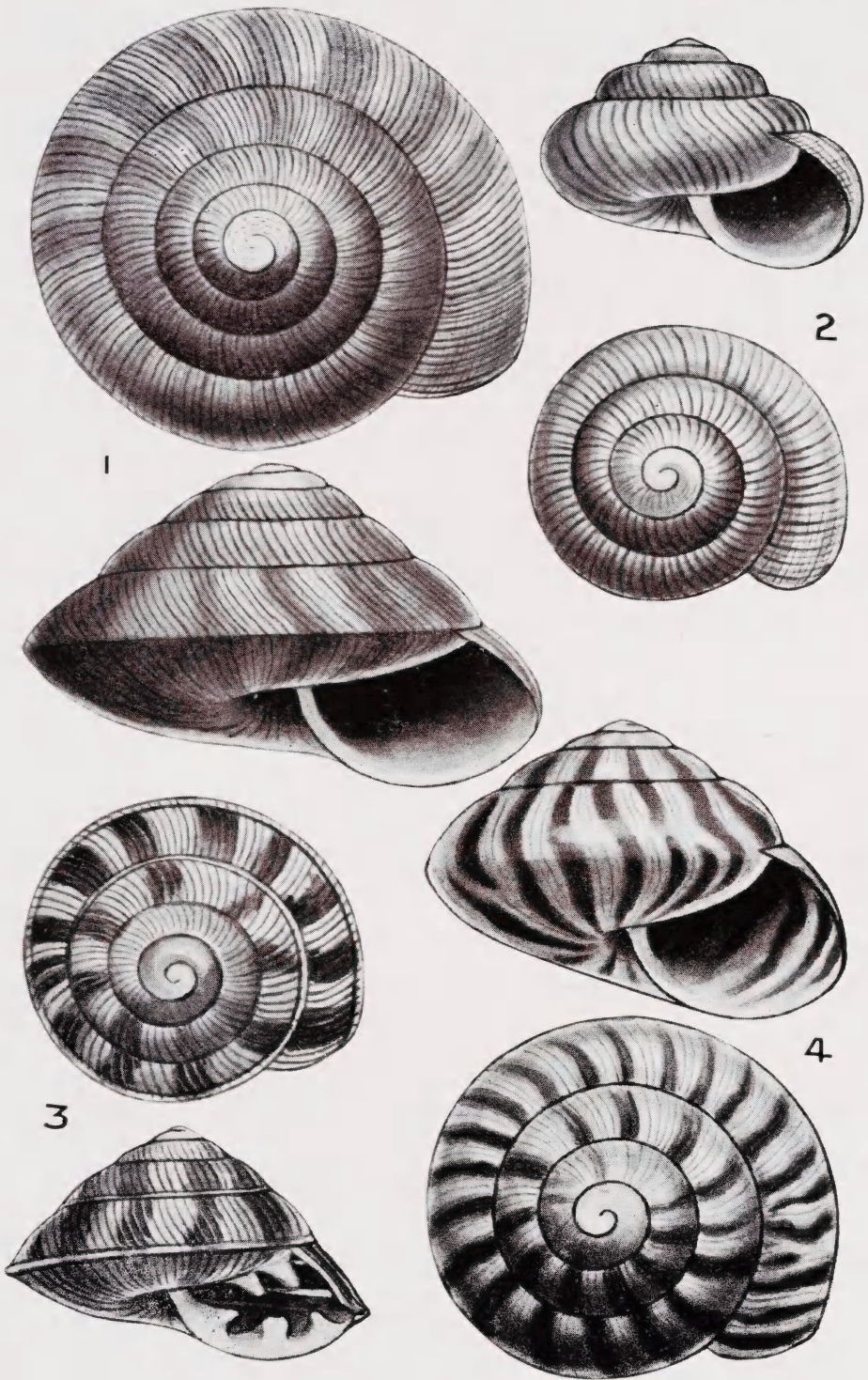


Fig. 1. *Laomarex sericea* n. sp., 2.00 mm. x 3.25 mm. North East Id. Holotype.
 Fig. 2. *Paralaoma turbotti* n. sp., 1.00 mm. x 1.6 mm. Great Id. Holotype.
 Fig. 3. *Laoma labyrinthica* n. sp., 1.5 mm. x 2.35 mm. Great Id. Holotype.
 Fig. 4. *Phrixgnathus subariel* n. sp., 1.9 mm x 2.8 mm. North East Id. Holotype.

Localities: Great Island; No. 1 (type) colony on S.E. landing slope below the provision depot (now extinct). No. 2 colony at about 500ft. half a mile north-east from the provision depot (eleven snails counted). North East Island No. 3 colony (flourishing).

Holotype: In Suter Collection, N.Z. Geol. Survey, Wellington. 91.00 mm. \times 37.50 mm.

Placostylus (Basileostylus) bollonsi caperatus n. subsp. Pl. 55, figs. 4, 5.

A smaller, narrower race with a taller spire than the typical species; spire ratio 2.40 to 2.58, height of shell approximately two and a-half times height of aperture. The maximum dimensions recorded were 97.00 mm. in height by 36.00 mm. in diameter, and the minimum adult dimensions 84.00 mm. by 33.50 mm.

Apparently the only available food for this colony is the leaves of the ngaio, *Myoporum laetum*. It is probable that lack of a normal diet of the leaves of *Corynocarpus*, *Melicope*, *Melicytus*, and probably *Meryta* (available under original conditions) has been one of the causes of the smaller adult size of this race.

Locality: Great Island; No. 4 colony, N.W. landing slope at about 500ft. in dense, stunted ngaio scrub (forty living snails counted).

Holotype: In Auckland Museum. 91.00 mm. \times 34.50 mm.

Placostylus (Basileostylus) bollonsi arbutus n. subsp. Pl. 55, figs. 6, 7.

A large, narrow, tall-spined race with a spire ratio of 2.42 to 2.58, height of shell approximately two and a-half times height of aperture. The maximum dimensions recorded were 113.50 mm. in height by 44.00 mm. in diameter and the minimum adult dimensions 93.50 mm. by 35.00 mm.

A noticeable feature of this subspecies is the constantly narrower embryo, which is rendered more conspicuous by acceleration in the coiling of the subsequent whorls (see Table D for comparative dimensions of embryo from three localities).

Localities: Great Island; No. 5 colony on S.W. seaward slope just south of Crater Head at about 700ft. (twenty-five snails counted). No. 6 colony, several hundred yards east of Hapuku Point at about 600ft. (extinct).

Holotype: Auckland Museum, 113.50 mm. \times 42.00 mm.

ELASMATINIDAE

Genus **TORNATELLINOPS** Pilsbry, 1915.

Type (o.d.): *Tornatellina novoseelandica* Pfeiffer, 1853.

Tornatellinops novoseelandica (Pfeiffer, 1853).

1913—*Tornatellina novoseelandica*: Suter Man. N.Z. Moll., p. 769.

1915—*Tornatellina (Tornatellinops) novoseelandica*: Pilsbry, Man. Conch. 23, p. 181.

Type locality: New Zealand.

Locality: North East Island, in leaf mould (G. A. Buddle, Jan., 1948).

This is the only Three Kings land mollusc so far found that is identical with a mainland species.

APPENDIX.

Since the above was written a further landing was made on Great Island during Wednesday, 6th October, 1948, through the generosity of Mr. A. J. Black, of Dunedin, who transported a Museum party of four in his vessel, the m.v. "Alert." During four hours ashore I visited No. 4 and No. 5 *Placostylus* colonies and found marked regeneration of the surrounding vegetation. At the latter locality I gathered a bag of leaf mould which is now being sorted for small snails.

Already several new species have been located, but descriptions of these must be deferred for a later paper. The most striking addition is a further species of *Murdochia*, a relatively large trochiform snail, 6 mm. in diameter with two spiral series of hirsute processes.

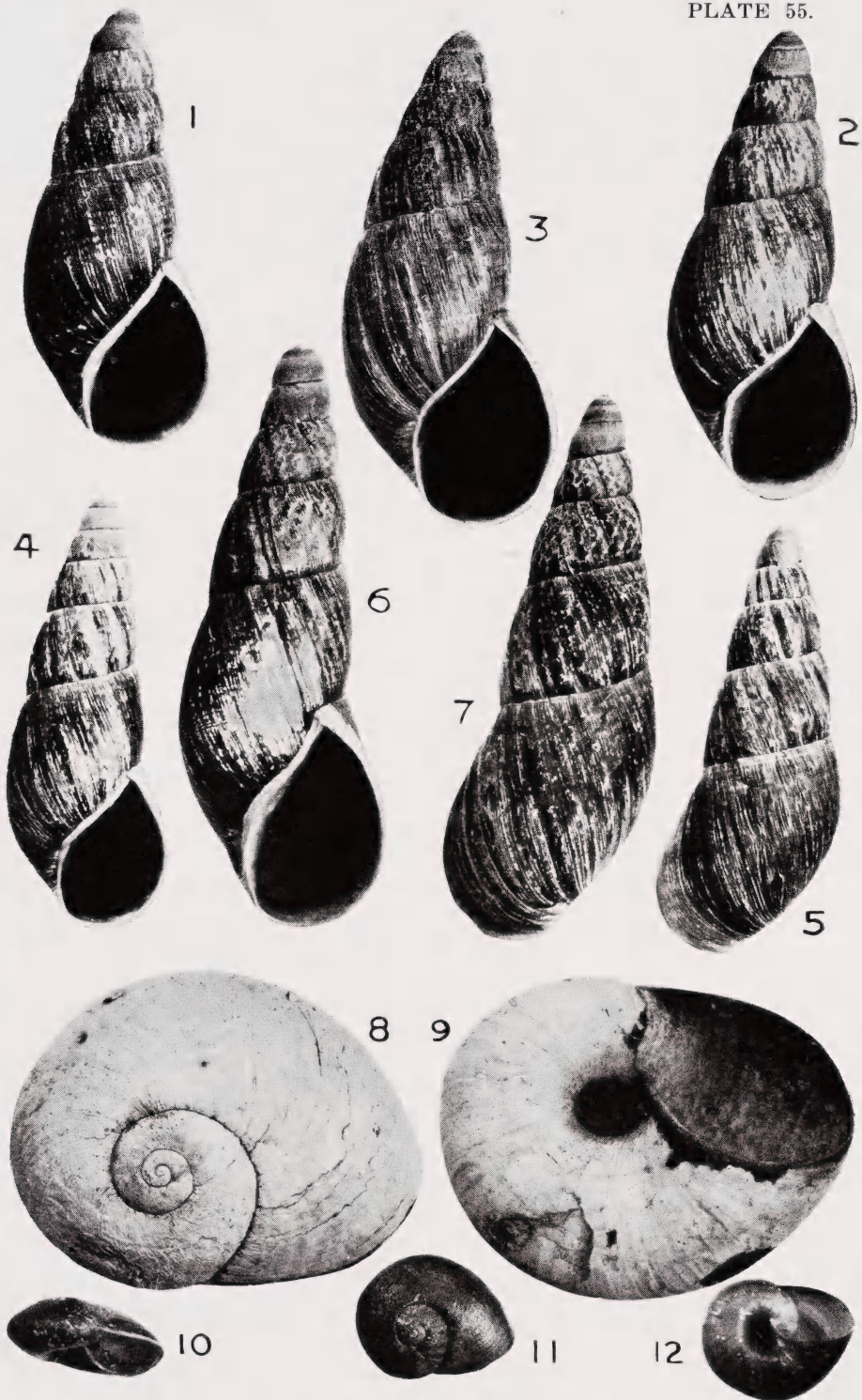


Fig. 1. *Placostylus (Basileostylus) bollonsi bollonsi* Suter, 1908. 91.00 mm. x 37.50 mm. Great Id. Holotype.
 Fig. 2. *Placostylus (Basileostylus) bollonsi bollonsi*: Great Id., N.E. end, No. 2 colony.
 Fig. 3. *Placostylus (Basileostylus) bollonsi bollonsi*: North East Id. No. 3 colony.
 Figs. 4, 5. *Placostylus (Basileostylus) bollonsi coperatus* n. subsp. 91.00 mm. x 34.50 mm. Great Id., No. 4. colony. Holotype.
 Figs. 6, 7. *Placostylus (Basileostylus) bollonsi arbutus* n. subsp. 113.50 mm. x 42.00 mm. Great Id., No. 5 colony. Holotype.
 Figs. 8, 9. *Rhytida (Rhytidarex) buddlei* n. sp. 29.0 mm. x 64.0 mm. South West Island. Holotype.
 Figs. 10-12. *Rhytida (Rhytidarex) johnsoni* n. sp., 11.5 mm. x 22.0 mm. Holotype (Fig. 11) and paratypes, North East Id.